

2008 COMPACT MODEL

REPLACING CIRCUIT BOARDS AND RECTIFIER

BACKGROUND NOTES

From photographs and other details provided by the customer our technical staff have concluded that this unit has had a considerable amount of water on the touch screen PCB at some stage sufficient to cause a short circuit which has resulted in failure of the bridge rectifier that supplies 12 Volts to this PC board and the other computers.

As it is impossible to know what other damage has been done , in order to get the customers unit working again as soon as possible, we have decided to replace both main circuit boards. The 12 volt rectifier will of course also have to be replaced.

Normally damage like this would not be covered by warranty , however as gesture of goodwill iCool is providing a new logic control and relay PC board and a complete touch screen assembly. The customer will need to provide a competent person capable of carrying out the replacement work. This is not difficult but certainly requires a basic understanding of electronics.

The scope of the work is described and illustrated below. If anything is not clearly understood please contact iCool.

PLEASE TURN OFF THE MAINS POWER BEFORE PROCEEDING
There are high voltages inside the unit and although the system is well protected with an earth leakage safety device it is still much better to be cautious.

STEP 1. Remove the YELLOW screws holding the touch screen panel NOT the ones indicated in RED.

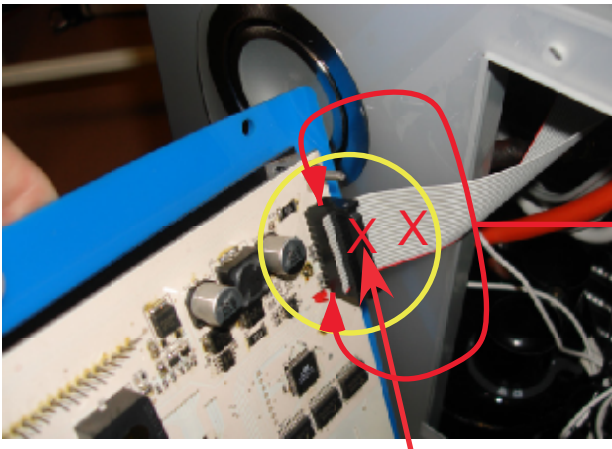


REMOVE THE 4 BIGGER SCREWS ONLY. (in the yellow circles)
Use a small Allen Key

DO NOT REMOVE THE OTHER 4 SCREWS marked with RED X.

Swing the Touch panel to the left and away from the cabinet.

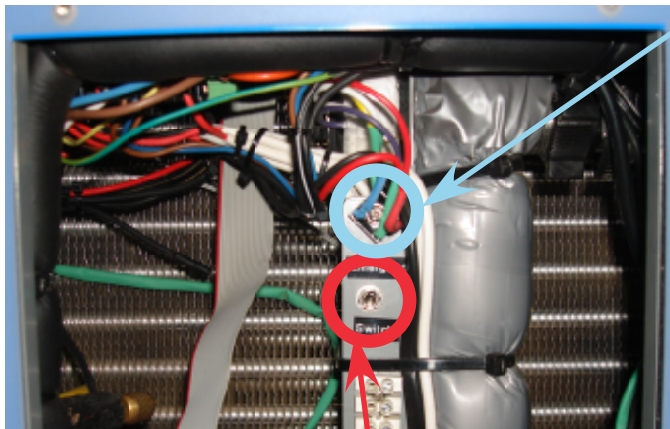
Unplug the single flat plug from the screen, **BEING CAREFUL TO HOLD THE PLUG AT THE BASE. DO NOT PULL ON THE FLAT CABLE AND DO NOT PULL THE PLUG FROM THE TOP** as this may loosen the cable connection. SEE ILLUSTRATION BELOW



PULL BY GRIPPING THE BOTTOM OF THE PLUG

DO NOT PULL FROM THE TOP PORTION OF THE PLUG OR STRESS THIS CABLE OR IT MAY COME APART.

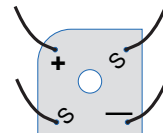
STEP 2. Locate the 12 Volt Bridge Rectifier as shown in the illustration below.



THIS IS THE BRIDGE RECTIFIER YOU WILL NEED TO REPLACE. IT LOOKS LIKE THIS



THIS IS THE OVERRIDE EMERGENCY OVER RIDE SWITCH. NOTE WHERE IT IS FOR LATER TESTING



THE NEXT STEP IS CRITICAL, IT MUST BE DONE CORRECTLY

STEP 3. PLEASE READ ALL OF THIS SECTION FIRST BEFORE BEGINNING.

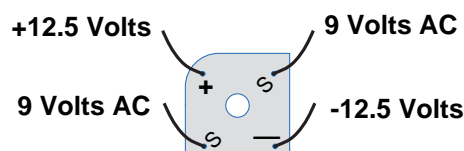
The 4 wires soldered to the faulty rectifier need to be de soldered one by one and soldered to the EXACT same position on the new rectifier. Then the screw holding the old one can be removed and the new one screwed in place. The legs on the new one can be cut short as they are on the old one. It must not be possible for any of the wires or legs to touch each other.

EACH WIRE MUST BE RE SOLDERED TO EXACTLY THE SAME POSITION ON THE RECTIFIER.

THE WIRING COLOURS IN THIS PHOTOGRAPH MAY BE DIFFERENT ON YOUR UNIT , DON'T FOLLOW THE COLOURS FOLLOW THE POSITION OF THE ORIGINAL WIRE AND MAKE SURE IT IS SOLDERED TO THE SAME POSITION ON THE NEW DEVICE.

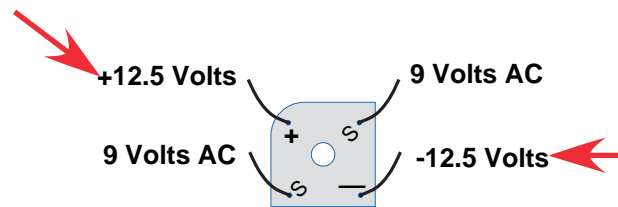
THE POSITIONS CAN BE IDENTIFIED WITH REFERENCE TO THE ONE ROUNDED CORNER ON THE DEVICE, ALL OTHER CORNERS ARE SQUARE.

FAILURE TO ENSURE THAT EACH WIRE IS SOLDERED TO THE EXACT SAME POSITION ON THE NEW DEVICE WILL DESTROY IT.



THE DEVICE MAY NOT BE MOUNTED THIS WAY UP ON YOUR UNIT, THIS IS NOT RELEVANT, IT IS ONLY REQUIRED THAT EACH WIRE IS REPLACED ON THE SAME PIN IT CAME FROM ON THE ORIGINAL DEVICE WITH REFERENCE TO THE ROUNDED CORNER, REGARDLESS OF WHETHER OR NOT IT MATCHES THE COLOURS OR ORIENTATION IN THESE PHOTOGRAPHS.

PLEASE PAY VERY CLOSE ATTENTION TO THESE 2 CONNECTIONS. IF THEY ARE ACCIDENTALLY REVERSED YOU WILL DESTROY THE MAIN RELAY AND CONTROL PC BOARD INSIDE YOUR UNIT.



WE HAVE PROVIDED YOU WITH A NEW MAIN RELAY AND CONTROL PCB (The one inside the unit screwed to the top cover with a row of relays and several green multi pin plugs)) HOWEVER IT MAY NOT BE NECESSARY TO REPLACE IT. IT MAY NOT BE WORKING AT PRESENT SIMPLY BECAUSE THE RECTIFIER HAS BEEN DESTROYED AND THEREFORE THERE IS NO 12 VOLT POWER SUPPLY TO IT. THIS BOARD CAN NOT TOLERATE A REVERSAL OF THE PLUS AND MINUS SIDES OF THE POWER COMING FROM THE RECTIFIER YOU HAVE JUST REPLACED, THAT IS WHY IT IS ESSENTIAL THAT THESE ARE SOLDERED TO THE CORRECT POSITION ON THE RECTIFIER.

A RELIABLE WAY TO ENSURE THE CORRECT WIRING IS TO REPLACE THE WIRES ONE AT A TIME, REMOVING ONLY ONE FROM THE OLD RECTIFIER AND SOLDERING IT TO THE NEW ONE BEFORE MOVING ON TO THE NEXT WIRE. IDENTIFY THE POSITION ON THE NEW ONE WITH REFERENCE TO THE ROUND CORNER.

STEP 4. Now that you have replaced the rectifier and you are confident that the wires are in the correct place we can test to see if the 12 volt supply is working.

Do not replace the TOUCH SCREEN for this test, it is not required yet and may cause confusion.

Plug in the mains power and turn on the main power switch on the side of the unit.

The unit may start immediately if the Emergency switch position has been previously changed during the original diagnosis. Otherwise change the position of the Emergency switch and see if the unit starts.

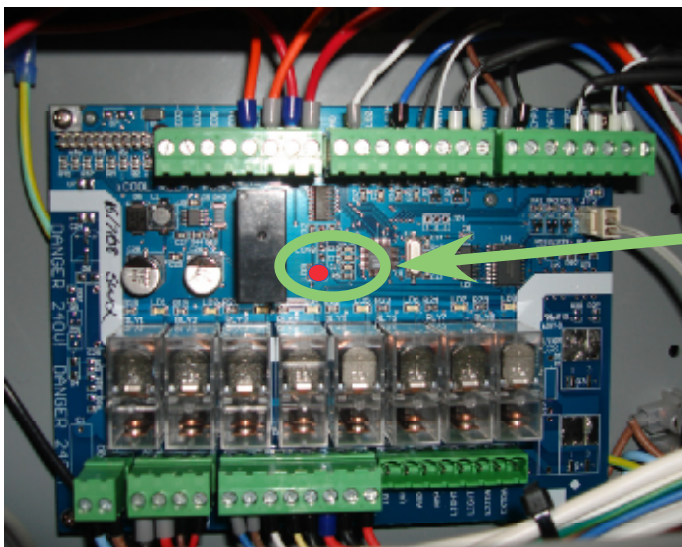
If it starts the fans and compressor, then you have correctly replaced the rectifier and established that the lack of 12 volt power was the main problem.

Turn the emergency switch to another position so that the unit stops working.

While the mains power is still connected and the main switch still in the ON position (UP) Look through the hole where the touch screen normally sits and up at the Main Relay and Control Board inside the unit fixed to the top left of the cabinet. **DO NOT PUT YOUR HAND INSIDE THE UNIT THERE IS HIGH VOLTAGE INSIDE**

Look at the center of the PC Board and note if there is a small red light slowly flashing. This is the "Heartbeat" light that indicates that the computers are working correctly.

IF THE HEARTBEAT LIGHT IS WORKING AND THE UNIT RUNS WHEN THE EMERGENCY SWITCH IS OPERATED THEN PROCEED TO THE NEXT SECTION. IF NOT GO TO SECTION 6.



A small Red Light flashes slowly in this position if this circuit board is operating normally. If this light is missing it means there is no power to this circuit board or it has been damaged in which case even the manual override may not operate.

STEP 5. REMOVE ALL POWER.

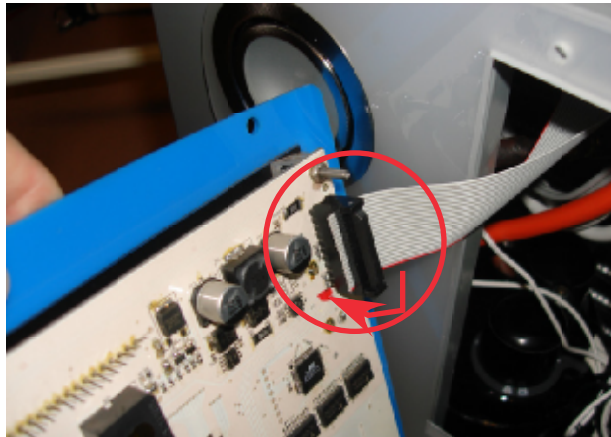
Make sure the wires you have soldered to the new rectifier are secure and can not touch each other.

Install the NEW TOUCH SCREEN we provided.

The old touch screen may not be faulty , but we have provided you with the latest version which has a metal shield for better protection, more reliable touch button sensitivity in adverse conditions and a conformal coating to resist moisture. So we recommend that you use this new one. Please return to old one to us for evaluation.

Make sure you plug the ribbon cable in correctly and be careful as this multipin cable plug is easy to damage if not handle correctly.

Make sure the RED wire on the ribbon cable aligns with the RED DOT (down) on the PC Board and that both rows of pins are inserted into the plug not just one row. With the new metal shield it is a bit more difficult to see this so take care.



This illustration does not show the metal shield which is now used on all Touch Screens

PLUG IS ALIGNED AS SHOWN WITH RED WIRE DOWN AND ALIGNED TO RED SPOT ON THE BOARD. MAKE SURE BOTH ROWS OF PINS ARE INSERTED. BE CAREFUL HANDLING THE PLUG NEVER PULL IT BY THE CABLE AND IF UNPLUGGING IT HOLD THE PLUG AT IT'S BASE TO AVOID PULLING THE ASSEMBLY APART.

Carefully replace the touch screen and replace the screws securing it to the cabinet.

Carry out a normal function test of all functions and ensure that your iCool is working correctly.

IF NOT, CONTACT ICOOL WITH A A DETAILED REPORT.

STEP 6.

THIS STEP ONLY APPLIES IF THE HEARTBEAT LIGHT WAS NOT ON OR THE UNIT DID NOT START WITH THE EMERGENCY SWITCH

This may indicate that the Main Relay and Control Board has been damaged. we have provided a new board for this purpose.

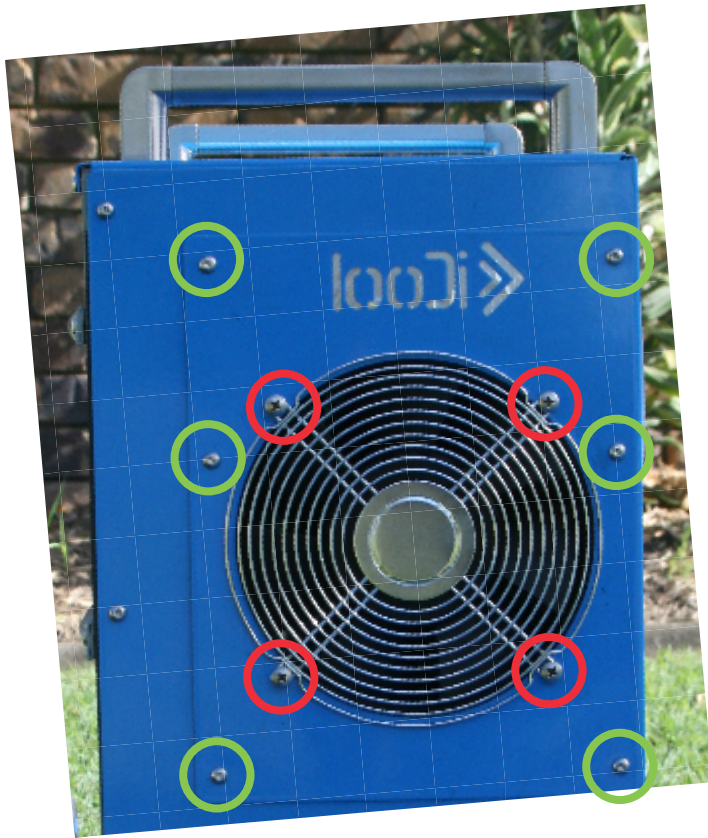
As this is a much more difficult step, we do not recommend changing this board if the previous steps have now restored your unit to normal operation. There is nothing to be gained by replacing this board if your unit is working.

Remove the Touch Screen if it is in place and **be very careful when removing the ribbon cable as pointed out on page 2.**

To access the Main Relay and Control Board it is easier if the left hand fan panel is removed.

Remove the screws holding the fan assembly on the left hand side of the unit (the left hand side means the left hand side while the unit's control panel and lights are facing you). Remove only those screws indicated in green **not the ones indicated in red.**

See the illustration on the next page



 REMOVE THESE 6 SCREWS

 DO NOT REMOVE THESE 4 SCREWS

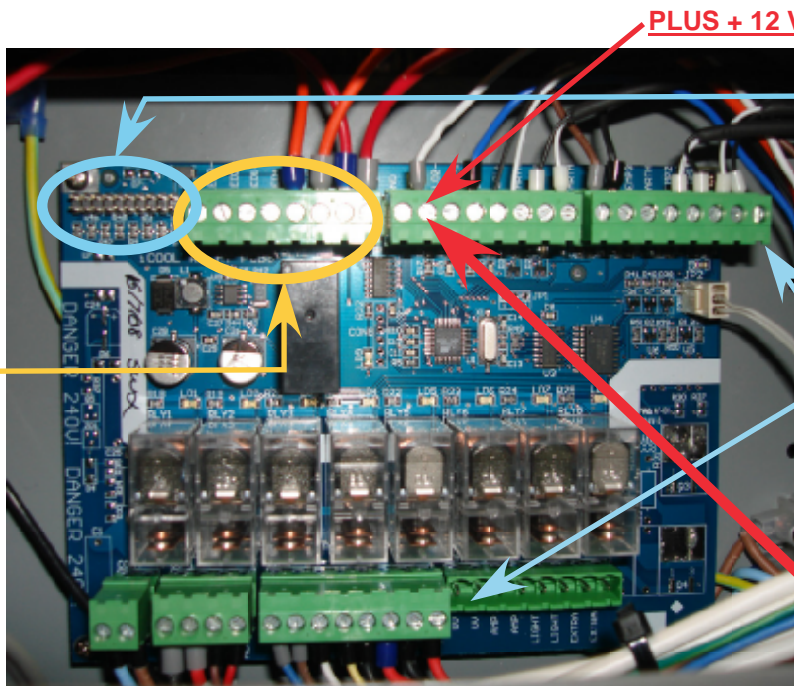
ONCE THE 6 SCREWS INDICATED IN GREEN ARE REMOVED THE ENTIRE FAN PANEL CAN BE MOVED AWAY FROM THE CABINET.

THE FAN ASSEMBLY IS CONNECTED BY A SINGLE CABLE THAT CAN BE LEFT IN PLACE AND THE ASSEMBLY CAN HANG ON THE SIDE OF THE CABINET

THIS GIVES BETTER ACCESS TO THE PC BOARD

Remove all of the plugs , in the Compact unit there are 5 green snap in multi pin plugs, one 22 wire ribbon cable plug, plus a very small off white colour 2 pin plug for the emergency switch connector.

MAKE ABSOLUTELY CERTAIN THAT THE PLUGS ARE ALL REPLACED IN THE SAME POSITION, MAKE A SKETCH DIAGRAM IF NECESSARY.



PLUS + 12 VOLTS (NOT MINUS) ON THIS PIN

Please make sure the 22 pin flat ribbon cable plug is not stressed, pull it out by gripping the vase of the plug, never pull on the cable.

Please make sure all of the green plugs are firmly pushed into their sockets in the original positions. The system can not operate if any one of these plugs is loose or not connected.

Your Compact model does not have this plug (yellow circle)

BEFORE INSTALLING A NEW PC BOARD, MAKE SURE THAT YOU CAN MEASURE PLUS + 12 VOLTS (NOT MINUS) ON THIS PIN BEFORE PROCEEDING. IF THIS IS WRONG THEN THE REASON THIS PCB IS NOT OPERATING IS ALMOST CERTAINLY BECAUSE THE WIRING OF THE RECTIFIER YOU REPLACED IS REVERSED. THIS WILL DESTROY IT.

THIS PCB CAN NOT TOLERATE A REVERSED POWER SUPPLY. DO NOT INSTALL THE NEW PCB UNTIL YOU ARE CERTAIN THAT THIS PIN IS PLUS 12 VOLTS (the negative rail is on any of the 4 corners where the mounting screws are, or any pin on the top row marked negative -.)

The PC Board is secured by 4 screws , one at each corner. They are a little difficult to reach but it may be easier to see what you are doing if you turn the iCool upside down or on it's side.

The procedure for successfully replacing this board is simply a matter of replacing all the plugs and cables exactly as they were in the original one.

There may also be a single earth wire spade type connector secured under one of the 4 screws holding the board. **It is absolutely essential for safety reasons that this is replaced as you found it.**

Once the new PC Board is in position, **recheck that all the plugs are secured and in their original positions.**

Make certain that the ribbon cable is in position with all pins inserted (it is easy given the difficult position, to accidentally cover only one row of pins in which case the unit can not function).

Replace the fan panel by reversing the procedure at the top of page 5.

Before replacing the Touch Screen, repeat the run test with the emergency switch function as described in Step 4.

If this does not work but the "Heartbeat" light is flashing, check that the small off white 2 pin plug has been replaced properly on the PC Board. This is the wire to the emergency switch and it can not function if this is not properly in place.

Even if the emergency function does not work due to the very small switch wire plug not being in place, the unit should still be able to now operate in the normal automatic mode if the Heartbeat light is flashing. To do this it of course it needs the Touch Panel which also contains the auto control computer.

If the emergency switch test does work, then turn the switch until the unit stops before replacing the Touch Screen Panel, otherwise it will be locked in the manual over ride state and the automatic controls will have no effect.

HOPEFULLY YOUR PROBLEM IS NOW SOLVED. AS THIS DAMAGE WAS CAUSED BY A LOT OF WATER ON THE BACK OF THE TOUCH SCREEN PLEASE TRY TO MAKE SURE IT DOESN'T GET SPAYED WITH A DIRECT FLOW OF WATER.

AFTER REPLACING THESE P C BOARDS IT IS VERY UNLIKELY THAT YOUR UNIT WOULD NOT NOW BE WORKING PROPERLY UNLESS SOMETHING HAS BEEN DONE INCORRECTLY. THE MAIN THINGS THAT CAN GO WRONG DURING REPLACEMENT PROCEDURES ARE

PLUGS NOT IN PLACE OR NOT SEATED CORRECTLY,

WIRES SOLDERED TO THE WRONG POINTS OR

THE VOLTAGE REVERSED TO THE MAIN RELAY BOARD WHICH IS COVERED EXTENSIVELY ABOVE.